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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey
BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING
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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station — Beltsville, Maryland
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YELLOWS OR XANTHOSIS IN STRAWBERRIES IN EASTERN UNITED STATES

J. B. Demaree

The writer, in company with E. B. Morrow, North Carolina Agricultural Experiment Station, and George M. Darrow, U. S. Bureau of Plant Industry, Soils, and Agricultural Engineering, visited a strawberry field near Teacheys, North Carolina, May 20, 1948, where Morrow had previously found a trouble he was unable to diagnose to his satisfaction. This field was planted to a comparatively new variety known as Massey, grown locally in the strawbery district having Wallace, North Carolina as the center. The variety is normally vigorous in that locality and forms runners freely. The field was set in 1947 with plants from two sources. Six rows along one side of the field were set with the owner's plants and the rest of two acres (40 rows) was set with plants purchased from a strawberry-plant grower of another State. The six rows set with the locally-grown plants were normal in appearance and made a good bed as the result of heavy production of runners the previous autumn. The leaves were normal in size and the petioles stood upright. A heavy crop of berries was obtained from the six rows earlier this season.

The remainder of the field was in striking contrast to the six-row section. The plant stand was thin, as the result of meager runner production. Both mother and runner plants were dwarfed, with small leaves, short petioles, and a general appearance of weakness. The grower reported harvesting less than half a crop from this portion, as compared with the six rows. Scattered through this thin part of the field were occasional clumps or short sections in the rows with large normal-appearing plants. The clumps of plants stood out in marked contrast to the dwarfed and weak plants composing the bulk of the rows. The owner reported that the scattered clumps of vigorous plants had developed from his own stock used to reset in spaces where the original plants had died.

In the opinion of the writer, the abnormalities noted in this North Carolina field were typical symptoms manifested by some eastern strawberry varieties when infected with the yellows virus disease, or xanthosis.

This diagnosis was based upon the results of investigations conducted during the past six years which included (1) observations on the behavior of plants of the Marshall, a good virus indicator variety, when grafted to eastern varieties suspected of being infected with yellows, either collected by the writer, or sent to him by growers or State workers in various eastern States; (2) observations made in many eastern strawberry fields; and (3) close association with the BPI strawberry breeding plots, Beltsville, Maryland where the yellows virus disease had been present for several years, and had increased to such serious proportion in recent years that the plots were abandoned in 1947 on account of virus infection.

It was concluded that the imported plants set in the North Carolina field were all infected with yellows. The healthy plants in the adjacent six rows helped in determining the cause of the unsatisfactory growth and low yield in the major portion of the field, serving as controls, which are not often found in a farmer's field. In the absence of the controls the dwarfing could well have been diagnosed as the result of poor cultural practices, insufficient soil nutrients, etc. If only a few of the imported plants had been infected the grower probably would not have noticed the abnormality, or, if he did, would not have been concerned. The aphid vector, Capitophorus fragaefolii, for strawberry yellows was present in the field, which lends support to the diagnosis.

A field of the variety Catskill in Pennsylvania was inspected by the writer in March, 1948. The rows were thin, the plants dwarfed and weak, and the field was so poor it was plowed under before fruiting. The trouble was diagnosed also as yellows.

The general concept of symptoms of strawberry yellows, or xanthosis, as known in the United States, follows the original description given by Plakidas (5) in 1928. He described the symptoms as they appeared in California on the Marshall and "Marshall-like" varieties grown principally in California, Oregon, and Washington -- varieties not suitable for growing east of the Rocky Mountains. The "Marshall-like" varieties include the Marshall, Oregon Banner, Oregon Improved, New Oregon, New Oregon Improved, Oregon Plum, Rose, and Tuttle. All are thought to be either true Marshall or Marshall seedlings.

Plakidas listed the following symptoms as being characteristic for the Marshall-like varieties: Crinkling, curling, and usually upward cupping of leaves; marginal and interveinal yellowing of leaflets; dwarfing of leaves, both petioles and blades; and stunting of growth of the entire plant.

This description adequately covers the symptoms on the Marshall as they appear under various conditions throughout the season, but all symptoms may not show at the same time. Yellowing of the leaves, a symptom from which the term "yellows" was established, is a transitory character, becoming almost entirely masked under high temperatures and appearing only in spring and again in autumn. In fact, all symptoms except dwarfing tend to disappear during the summer months.

In striking contrast are the effects of yellows in eastern United States. On some eastern varieties the symptoms are manifested only in dwarfing of plants (small leaves and short petioles); other varieties may show cupping of leaves or interveinal yellowing in addition to dwarfing; still others exhibit very little dwarfing but complete, or nearly complete, suppression of stolon production; while in still others all symptoms may be entirely or almost entirely masked. The symptoms become accentuated the second year.

Plakidas observed these variations in symptoms in varieties other than the Marshall, but did not emphasize their importance. He regarded such variations as "varietal resistance." None of the eastern varieties shows the "yellow-edge" leaf manifestations as definitely as does Marshall, although Catskill approaches Marshall more nearly than others in this respect. Marshall is one parent of Catskill, which probably accounts for this characteristic.

Owing to the non-use of the Marshall-like varieties east of the Rocky Mountains, no variety exhibits the conspicuous yellow-edge leaf sign of yellows to serve as a definite criterion for recognizing the disease. Consequently, observers of strawberry diseases in eastern United States have not generally accepted the concept of a strawberry virus complex as being prevalent. This has led to a complacency among pathologist, horticulturists, and plant growers concerning the prevalence and importance of the disease.

The spread of strawberry yellows from diseased to healthy plants in any locality or region is contingent upon the presence of the aphid Capitophorus fragaefolii, the only known insect vector of this disease. The writer became acquainted with this particular aphid when it was collected[1] in 1940 in the BPI strawberry selection plots at Beltsville, Maryland. The following year this insect was seen in several fields in the extensive strawberry-plant-propagating sections of the Maryland Eastern Shore. The aphid population was light each year in those two sections of Maryland until the fall of 1946 and spring of 1947 when it increased to an epidemic proportion. The distribution of the aphid in Eastern United States is not known.

The extent of the yellows infestation east of the Rocky Mountains and the location of areas of greatest infestation have not been determined. No survey has been made. The usual form of survey would perhaps furnish very little information since thus far no one has been qualified to separate by field inspection the ordinary dwarfing induced by unfavorable growing conditions from the mild to moderate symptoms of yellows. The most satisfactory method for demonstrating or determining the presence of the yellows virus disease in some of our eastern strawberry varieties is by grafting to a virus-free indicator plant, such as Marshall. The writer has grafted a considerable number of varieties to Marshall, taken by random sampling from several eastern States. Most varieties have transmitted yellows to the indicator plants. It is believed, however, that the greatest concentration of virus-infected plants is in the middle Atlantic States.

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[1] The aphids were collected November 4, 1940 by Floyd Smith, U. S. Bureau of Entomology and Plant Quarantine, and identified by P. W. Mason of the same Bureau.

Certain of the older varieties such as Aroma, Catskill, Dorsett, Dunlap, Howard 17 (Premier), and others, are seldom found free of yellows. Stock of even some of the more recently introduced varieties, as Fairpeake, Midland, and Maytime, carry virus which indicates that the latter may have become infected prior to, or soon after, their introduction.

New Jersey authorities have recognized the presence of virus in their strawberry fields for some time. Clarke (1), writing about virus diseases in strawberries in New Jersey, stated in 1946: "Strawberry growers have reported for years that plants of certain varieties became weak and hard to grow until finally the variety 'ran out' and was no longer planted. Horticulturists in recent years have considered this 'running out' of strawberry varieties to be due to diseases of various kinds (such as red stele and other fungus diseases) and possibly virus diseases. Although virus diseases have been mentioned as a possible cause, no specific virus or specific symptoms have been named in the East until Demaree (3) made his report." Christ (2), also of New Jersey, reported in 1948 on the prevalence of strawberry yellows in that State and said, "Strawberry yellows, a virus disease, is present in some fields in quantity sufficient to appreciably reduce the yield."

There is need for research by small-fruit specialists east of the Rocky Mountains on the strawberry virus situation. The writer has made some progress but owing to the many varieties needing indexing some time will elapse before the work can be completed. Indexing the varieties to obtain virus-free stocks of each is only a start; maintenance of the resulting stock of plants free of virus will be a more important project.

Two methods are available for remedying, or perhaps eliminating, the strawberry-virus-disease problem in eastern United States. First, a temporary or stop-gap method for immediate adoption by extension workers consists simply in the recommendation to growers to use for setting new fields only vigorous plants making runners freely, having large, green, smooth leaves with upright petioles, and taken only from fields known to have been productive.

Second, a slower but a more positive method for providing growers with better stock is that of indexing the more desirable varieties with Marshall or some other good indicator variety. Plants thus proved to be free of virus must be propagated under surveillance in a vector-free area for replacement of planting stock now being used.

The indexing of varieties and maintenance of clean stock can probably best be done by State experiment station workers. Since each State grows comparatively few varieties, it will be a small task to index those few sorts best adapted for growing in that particular State. When a sufficient quantity of clean stock has been propagated from the indexed varieties, a portion may be distributed to plant growers for mass production under State regulations assuring maintenance of clean stock.

The most likely places for finding virus-free plants for indexing may be communities that follow a policy of using their home-grown plants for starting new fields rather than purchasing new plants each year from established plant growers.

Great Britain's strawberry industry was faced with a serious virus-disease situation immediately after the First World War when its production and acreage declined rapidly. Beginning in 1931 the propagation of clean stocks was attempted. Since then a marked improvement has been made in yields by a process of collecting stock from promising sources, selection of individual plants, testing for virus, raising clonal families, and finally multiplication of the best ones for commercial distribution. Under the control of the Ministry of Agriculture and Fisheries, no plants of several of the leading varieties are now permitted to be propagated except those previously tested and certified by the Ministry inspectors (4). This method has proved practical and successful.

The writer believes that the maintenance of virus-free strawberry plants will be comparatively easy in eastern United States. As stated previously, the spread of yellows from plant to plant depends upon the presence of the white strawberry aphid. He has examined many strawberry fields in several eastern States during the past eight years and has found this particular aphid in only five widely separated areas. However, it has not been possible to make a general survey. If the aphid is established in only a few restricted areas east of the Rocky Mountains, then there should be little difficulty in maintaining virus-free stock in the aphid-free regions, provided the aphid is not subsequently introduced on imported plants. Maintenance of virus-free strawberry plants in the three Pacific Coast States has been an extremely difficult proposition because of the wide distribution and common occurrence there of the aphid vector in all the principal strawberry-growing sections.

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DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, U. S. DEPARTMENT OF AGRICULTURE

THE LITTLE CHERRY SITUATION IN IDAHO

Carl W. Nichols

Evidence has been found that indicates that there may be two strains of the Little Cherry virus in Idaho. In the northern part of the State in Nez Perce County near Lewiston, the Little Cherry noted was similar to the small, long hanging, late ripening fruit reported across the State line in Washington. In the southern part of the State in Canyon, Gem and Payette Counties, new symptoms were noted in cherry trees having Little Cherry virus. One of these symptoms was shorter pedicels on the affected fruits. Such a condition was not noted on the fruit showing symptoms of Little Cherry in northern Idaho. Pedicel measurements were made on two trees of the Lambert variety, of the same age and vigor and about sixty feet apart in the John Gamage orchard near Emmett, Idaho. Most of the cherries on the west half of one tree were expressing symptoms of Little Cherry. The cherries on the east half of the same tree were apparently normal. No fruit on the other tree expressed virus symptoms. Three comparable branches were selected from the two trees, one from the apparently virus-free tree and two from the symptom-expressing tree. From the latter, one branch had fruit showing Little Cherry symptoms while the fruit from the other branch appeared normal. All fruit was collected from these branches and the pedicels measured. The results of these measurements are listed in Table 1.

Table 1. Table comparing pedicel lengths of cherries showing Little Cherry symptoms with pedicel lengths of apparently normal cherries.

Source	Number of fruit pedicels measured	Length in inches: Maximum	Minimum	Average
Fruit from branch of L.C. infected tree Fruit showing L.C. symptoms	60	1.75	.87	1.27**
Fruit from branch of L.C. infected tree Fruit not showing L.C. symptoms	59	2.50	1.50	1.90
Fruit from branch of apparently virus-free tree	52	2.25	1.25	1.89

** Difference significant at odds of 99:1

This table shows that the fruit expressing the virus symptoms had pedicels that averaged one-half inch shorter than the normal-appearing fruit. This difference seemed consistent throughout observations made in southern Idaho.

Two other symptoms that were apparent in some of the cherry trees in southern Idaho were indicated by the foliage: internodes on the new growth were shortened resulting in a rosetted appearance, and edges of the leaves were undulated giving them a wavy look. The foliage symptoms, however, did not appear on all Little Cherry infected trees in southern Idaho, but only on those that showed evidence of having had the disease for a number of years. These symptoms were not observed on Little Cherry infected trees in northern Idaho.

UNIVERSITY OF IDAHO, MOSCOW

SURVEY FOR LITTLE CHERRY DISEASE IN IDAHO IN 1948

Carl W. Nichols

Although the Little Cherry disease was first located in Idaho in 1946, no survey has been possible until this past summer. The University of Idaho Agricultural Experiment Station, the Idaho State Department of Agriculture and the Idaho Crop Pest Control and Research Commission co-operated in this survey.

A program of voluntary removal of Little Cherry diseased trees has been approved by the Idaho Horticultural Society.

The results of the survey are listed in the following table.

Table showing number of cherry trees inspected, number of properties inspected, and amount of Little Cherry infection

County	Number of trees Inspected	Infected	Number of Properties Inspected	Infected	Percent of infection
Adams	1	1	1	1	100
Bonner	144	0	4	0	0
Canyon	5942	3	36	2	.05
Gem	35320	278	64	21	.8
Gooding	400	0	1	0	0
Jerome	70	0	1	0	0
Kootenai	2094	0	15	0	0
Latah	2587	0	6	0	0
Nez Perce	4543	361	50	16	8.1
Payette	5075	258	13	3	5.0
Twin Falls	1994	0	9	0	0
Washington	1003	0	1	0	0
TOTAL	59173	901	201	43	1.5

UNIVERSITY OF IDAHO, MOSCOW

MOSAIC OF BARLEY IN NORTH CAROLINA

T. T. Hebert and G. K. Middleton

A mosaic disease of barley was observed for the first time in North Carolina in a small-grain nursery at Statesville in the spring of 1948. The symptoms were very similar to those described for wheat mosaic[1]. The infected plants were stunted and their leaves showed varying degrees of mosaic mottling.

This disease is probably caused by one or more strains of the wheat mosaic virus. Wheat planted adjacent to the infected barley area was also infected. McKinney[1] has shown that wheat mosaic can be transmitted to barley. Of the several varieties which he tested, Nakano Wase was the most susceptible. In the infected area of the nursery at Statesville, Sunrise (which is a Nakano Wase derivative) and some Sunrise crosses were susceptible while Iredell, Hooded 26, Bolivia, and Davidson were resistant.

One barley yield test, uniformly subjected to natural mosaic infection, contained 10 susceptible and 13 resistant strains. These barley strains later suffered a severe attack of powdery mildew. The strains in the test were classified and grouped according to their reaction to each disease. The average yield of each group of strains is given in Table 1. The average yield of the same groups at the same station in 1947, when neither disease was present in the nursery, is also given for comparison.

Table 1. Reaction of barley strains to mosaic and powdery mildew in a North Carolina yield test, 1948

Number of strains in group	Reaction to Mosaic	Reaction to Mildew	Yield in Bu./A 1948	Yield in Bu./A 1947
7	Susceptible	Susceptible	14.2	45.7
3	Susceptible	Resistant	28.3	44.8
7	Resistant	Susceptible	34.1	45.3
6	Resistant	Resistant	52.9	44.9

While an accurate measure of yield reduction cannot be obtained from such comparison, it strongly indicates that both diseases were important factors in reducing the yields of the susceptible strains.

Mosaic of barley is not sufficiently widespread to be of great economic

1 McKinney, H. H. A Mosaic of Wheat Transmissible to all Cereal Species in the Tribe Hordeae. Jour. Agr. Res. 40: 547-556. 1930

importance at present. However, since the major portion of the barley acreage in North Carolina is planted to the susceptible Sunrise variety, and since Nakano Wase has been used in developing other varieties grown in this area, it is felt that the disease is potentially dangerous and should be considered in a breeding program.

NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION

EFFECT OF TECHNICAL DDT, INCORPORATED IN QUARTZ SAND AND SOILS, ON THE GROWTH OF PEACH TREES

M. C. Goldsworthy

The use of technical DDT is becoming a common practice in the growing of peach crops to control the oriental peach moth (Grapholitha molesta Busck). Ordinarily several applications of this material are made in a single season, and an accumulation of about 10 to 15 pounds per acre may be expected each year in the orchard soil. The experiments described in this paper were conducted during 1945, 1946 and 1947 and were planned to determine the effect of DDT on Elberta peach trees when grown in sand and in various mineral soils containing the chemical. The sand was of pure quartz and possessed only a slight base exchange value; the soils were (1) Chester heavy loam, (2) Sassafras sandy loam, and (3) Evesboro loamy sand. The Chester soil was the heaviest and contained approximately 30 percent of colloidal material; the Sassafras contained approximately 12 percent; and the Evesboro soil, about 6 percent of colloidal material. All three soils are representative agricultural soils of the Middle Atlantic States.

In the nutrient solution cultures in sand, the technical DDT was used at the rate of 25, 50, 100, 200, 400, 800, and 1,000 pounds per acre of 6-2/3 inch soil depth (2,000,000 pounds). In these tests a formulated DDT mixture consisting of 25 percent of technical DDT, 75 percent of clay, and a small amount of wetting agent was used. Four replicates were set up at each concentration and these were randomized on the greenhouse benches in pairs since the nutrient solution supply system necessitated the irrigation of two crocks from a single storage bottle. The nutrient solution was the same in all cases and was composed of a total salt concentration of approximately 600 p.p.m. (175 p.p.m. of nitrogen, 150 p.p.m. of potassium, 200 p.p.m. of calcium, and 50 p.p.m. of phosphate). Traces of boron and manganese were also provided. Iron tartrate was added to maintain good chlorophyll activity. The plants were irrigated with the nutrient solution every four hours during the daylight period. The solutions were completely changed at irregular intervals, depending upon the amount of tree growth made, and the water levels were maintained in the solution bottles at all times.

The Elberta peach trees used for the studies were selected from a large lot of 1-year-old trees, budded on seedling roots, and were as nearly as possible similar in trunk and root size. Each tree was pruned back to several buds before planting and the total weight of the original root and trunk were recorded. The secondary or lateral shoots were pinched off throughout the tests, and in this way all growth was maintained as terminal growth. The experiment was terminated when the last trees matured their terminal buds.

Table 1. Effect of DDT, when added to sand cultures, on the growth of potted peach trees, calculated as grams of fresh tissue.*

Pounds of DDT per acre	Original weight of root system	Final weight of root system	Gain in root weight	Weight of new top	Total new growth
25	90	338	248	227	475
50	91	339	248	236	484
100	89	312	223	192	415
200	77	238	161	90	251
400	67	276	209	96	305
600	70	237	167	75	242
800	66	184	118	62	180
1,000	66	222	156	93	250
None	60	293	233	352	585

* Average of 4 replicates randomized

Least significant difference at 5% level 96.65
Least significant difference at 1% level 123.47

In the soil cultures also the Elberta peach trees were selected for similar size. The three soils described earlier in the text were used in these tests. The same DDT product described above was used at the rates of 25, 50, 100, 200, 400, 800, and 1,600 pounds per acre of 6-2/3 inch soil depth (2,000,000 pounds). After thorough mixing, the DDT and soil were transferred to 10-inch pots, the trees were planted, and the pots of each soil series were randomized on a single greenhouse bench. There were 8 replicates and 8 treatments, giving 64 potted trees for each of the 3 soil series. The current season's growth was allowed to form from a single bud and no attempt was made to remove the lateral growth in this series. Red-spider control was maintained by syringing with water and a very satisfactory crop of plants was harvested. Periodical applications of sodium nitrate solution were made to keep up the nitrogen level. The best tree growth was observed in the Chester heavy loam and the poorest in the Evesboro loamy sand.

In a second soil test, in which rather high DDT concentrations were used, attempts were made to find out whether or not such large additions deteriorated in the soil with time. The experiment was conducted over a period of two growing seasons with two plantings of peach trees, and the added DDT was in contact with the soil environment for a period of 18 months during the growth of the two successive plantings. In this experiment the chemical was used in the three selected soils at the rates of 1,000, 2,000, 4,000, and 8,000 pounds per acre of 6-2/3 inch soil depth (2,000,000 pounds). This is at a rather high rate of concentration, but it was thought that if peach trees were resistant to the material in the

Table 2. Top growth, in fresh weight, of Elberta peach trees growing in three types of soil containing DDT*

DDT concentration per acre	Soil type: Chester heavy loam	Sassafras sandy loam	Evesboro loamy sand
pounds	grams	grams	grams
25	222	204	73
50	203	207	115
100	191	227	128
200	109	186	71
400	78	162	45
800	48	87	33
1,600	19	48	26
None	221	166	87
Least signif. diff. at 5%	88.06	72.23	12.29
Least signif. diff. at 1%	103.67	84.26	14.34

* Average of 8 replicates, randomized

Table 3. Effect of DDT, in mixture with soil for two seasons, on the fresh weight of top growth of two successive plantings of Elberta peach trees in pots

Pounds of DDT per acre of soil	Chester heavy loam: Grams top growth		Sassafras sandy loam: Grams top growth		Evesboro loamy sand: Grams top growth	
	1945	1946	1945	1946	1945	1946
1,000	28.2	29.8	19.1	21.1	17.1	22.3
2,000	30.0	22.1	18.7	22.0	16.5	29.4
4,000	23.3	21.3	18.1	19.1	14.8	26.8
8,000	19.0	15.1	16.5	18.8	15.0	15.1

lower concentrations, changes, if any developed, could be more readily observed with the higher concentrations. In this series there were four concentrations and eight replicates, in three soils, so that 96 pots were used for randomization on the greenhouse bench. Growth was allowed to form from a single bud, but no attempt was made to suppress lateral branches. Sodium nitrate solution was added to keep up the nitrogen level and the trees were kept free of red spiders by water syringing.

At maturity, in the soil experiments, the trees were harvested by cutting the current growth back to the site of the original bud. All of the new wood and leaf growth were weighed and compared as fresh tissue. In the sand cultures all of the new root and top growth (leaves and wood) was weighed and compared.

Results

The data obtained from the quartz sand experiments are presented in table 1. This table shows the original and final weight of the root systems, the weight of top at maturity, and the total weight of top (leaves and wood) at harvest time. These figures indicate that growth was reduced with as little as 25 and 50 pounds of DDT per acre. The reduction became very pronounced at the 100-pound level. Beyond that concentration growth was very poor, and at the 1,000-pound level the growth was observed to be only 43 percent of that produced in the untreated plots.

The data from the first soil series are shown in table 2. No significant suppression of growth was exhibited in the Chester loam until a concentration of 200 pounds of DDT per acre was reached. In the Sassafras soil no significant retardation of growth was observed until the 800-pound level was reached. In the Evesboro soil the results were somewhat erratic and suppression was observed at the 25 and 200-pound levels but not at the 20- and 100-pound levels. In both the Sassafras and Evesboro soils the trees grew somewhat better with the 50- and 100-pound treatments than in the untreated soils.

The data from the second soil test are shown in table 3. The experiment was conducted during two growing seasons and the results indicate that, at a high level of DDT concentration in acid soils, the deleterious effect of DDT on growth appears not to be changed to any extent in that length of time.

Discussion

These studies show that 1-year-old Elberta peach trees, budded on seedling peach stocks, are sensitive to very small quantities of technical DDT when the seedling roots are grown in nutrient solutions in contact with the chemical mixed with quartz sand. As little as 25 pounds per acre (based upon the weight of 6-2/3 acre-inches of soil) of the technical chemical reduced root and top growth of peach trees. The effect on the root system was characterized by reduction in the volume of the root system and in the loss of the ability of the main and secondary roots to produce small fibrous rootlets. This is shown in plates 1 and 2.

When the budded Elberta peach trees were grown in soil, however, reduction of root and top growth was not generally observed until much

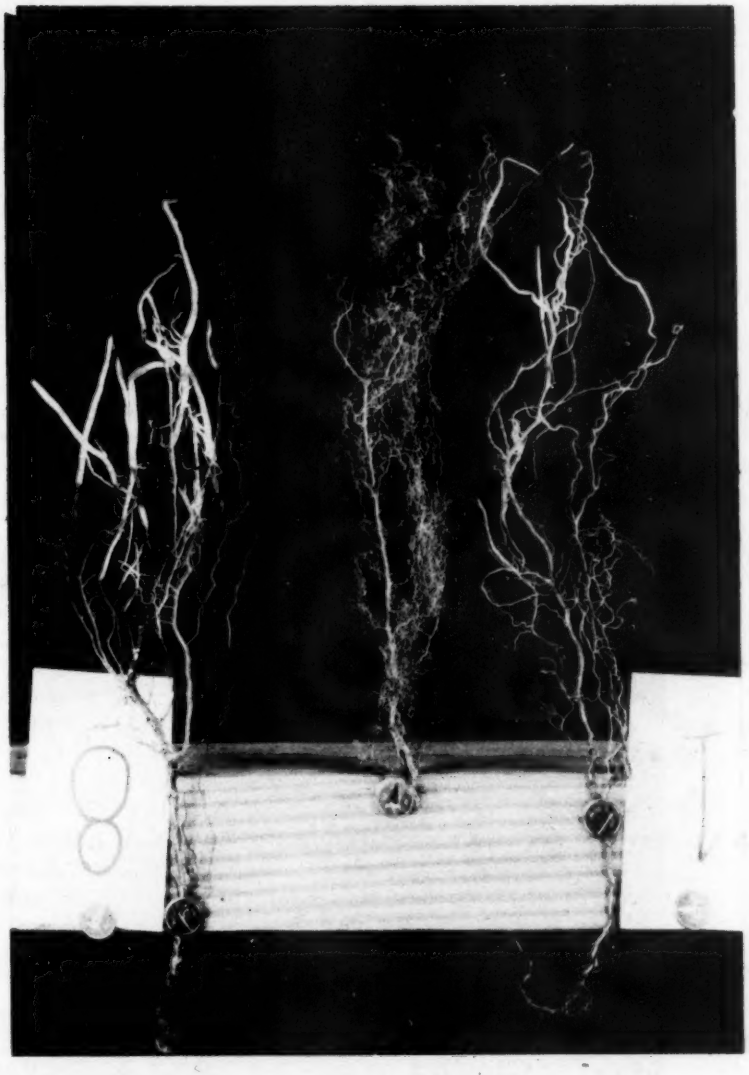
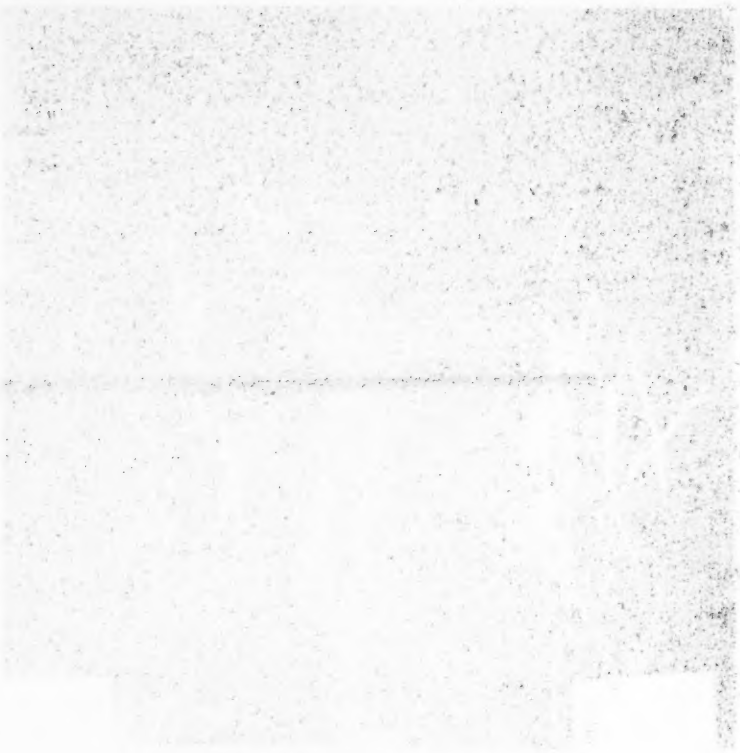


PLATE 1. Effect of DDT in quartz sand cultures on the growth of seedling peach roots. Left, 25 pounds of technical DDT per acre rate. Center, no DDT. Right, 1,000 pounds of technical DDT per acre rate.



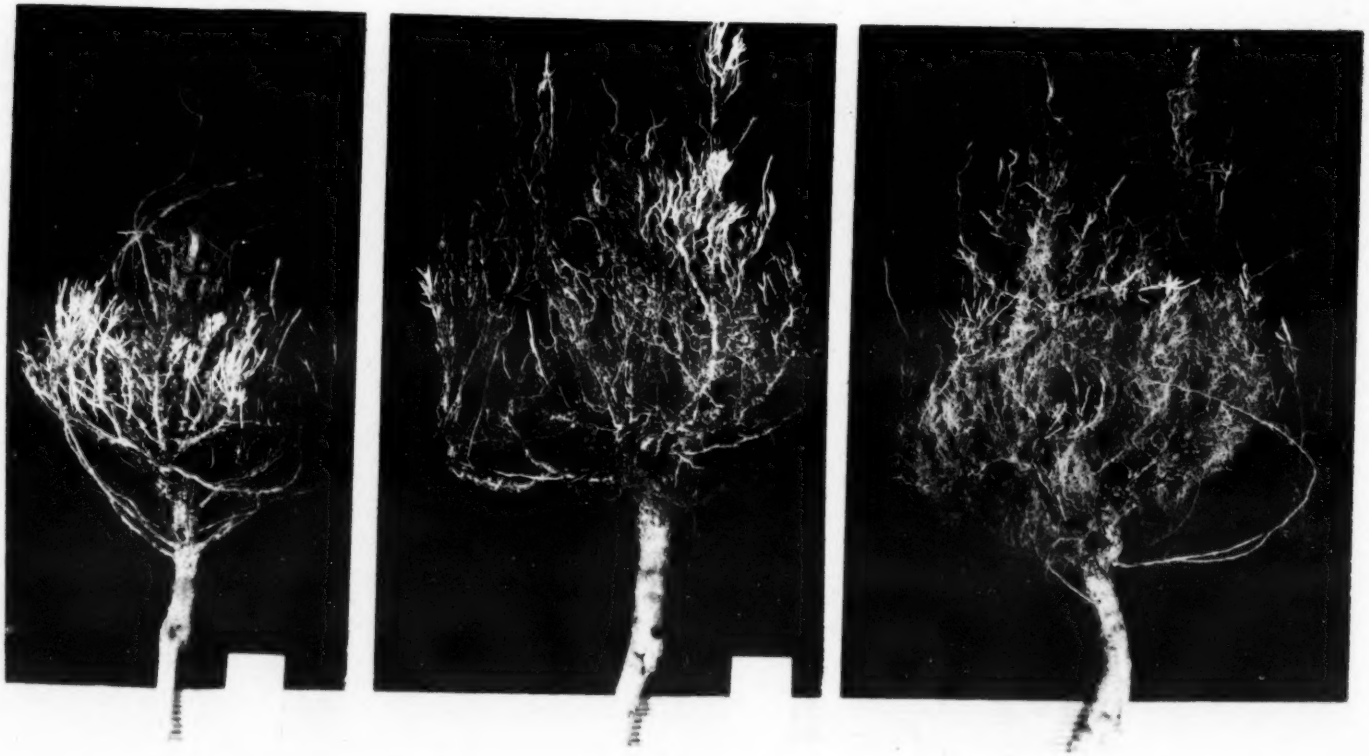


PLATE 2. Effect of DDT in quartz sand cultures on the growth of seedling peach roots. Left, no DDT. Center, 25 pounds of DDT per acre rate. Right, 1,000 pounds of DDT per acre rate.

greater concentrations of the chemical mixture were encountered. This effect varied somewhat with soil type. In the heavy Chester soil, reduction of growth was statistically significant at the 200-pound level; in the Sassafras soil, at the 800-pound level; and in the Evesboro soil significant reduction was evident for the 25-pound application, and again with the 200-pound application. At the 50- and 100-pound levels of application in all three soils the growth of roots and tops was practically as good as or better than that in untreated soils. In all cases where less top growth occurred less root growth was also observed.

When the budded Elberta peach trees were grown in the three soils containing 1,000, 2,000, 4,000, and 8,000 pounds of DDT per acre, top growth and root growth were appreciably reduced. This effect upon peach trees was not lost when the soils containing the relatively large quantities of technical DDT were cropped during a second season with Elberta peach trees. This result indicates that the material did not lose its deleterious characteristics toward peach growth during a period of approximately 18 months in contact with the various types of soil.

DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

VARIEGATION ("BLAKEMORE YELLOWS") IN KLONMORE STRAWBERRIES

N. H. Loomis

On March 29, 1948, in the strawberry district of southern Louisiana near Gonzales, one field of approximately one-half acre of Klonmore strawberries was observed in which 75 percent or more of the plants showed "variegation" resembling Blakemore yellows. Elsewhere in the Gonzales, Hammond, and Ponchatoula strawberry section, with the exception of one field (variety not identified), "variegated" plants were either entirely absent or constituted less than half of 1 percent of the planting. So far as it was possible to determine "variegation" on Klonmore has not been previously reported, although the local experiment station workers stated that occasional yellow plants have been observed since 1941. Morrow and Darrow in North Carolina obtained about 6 percent (15 in 239) of variegated seedlings when they selfed Klonmore (unpublished data).

Klonmore is a cross of Klondike and Blakemore originated by the Louisiana Agricultural Experiment Station.

DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, U. S. DEPARTMENT OF AGRICULTURE (U. S. HORTICULTURAL FIELD STATION, MERIDIAN, MISSISSIPPI)

ROOT-KNOT NEMATODES ON PEANUTS IN ALABAMA

Coyt Wilson

Although the root-knot nematode has never become a serious pest of peanuts in Alabama, there are populations of Heterodera marioni that attack peanuts readily. In a letter to the writer, Dr. G. Steiner, Nematologist, with the U.S.Department of Agriculture, states that these populations have been observed in some counties of North Carolina and in Virginia.

In 1946 a sample of runner peanuts was sent to the Experiment Station at Auburn from Coffee County in southeastern Alabama. The grower stated that the peanuts came from a field on which he had been unable to grow peanuts for several years and that the trouble had become so severe that the yield was less than 10 percent of that on neighboring fields. The peanuts appeared to be infected with the root-knot nematode. This diagnosis was confirmed by Dr. Steiner at Beltsville. Apparently, this was the first report of this trouble in Alabama.

In the summer of 1948 Spanish peanuts in Houston County, near Ashford, were found to be severely infected with root-knot. The infection was found in only one field. Although all plants in the field were infected, the disease was most severe in a few localized spots. The grower stated that in 1946 runner peanuts were planted in this field and that no root-knot was observed. In 1947 the field was planted in watermelons and cowpeas. A good crop of each was harvested. In 1948 the symptoms did not appear on the foliage until the plants were approaching maturity. A field of runner peanuts adjacent to the Spanish and apparently on the same type of soil appeared to be free of root-knot.

In the adjoining county of Geneva root-knot was found on runner peanuts in three different fields near Hartford. A portion of one of these fields was planted to runner peanuts in 1947. The other portion was planted to corn. There was practically no root-knot damage in the peanuts following corn but where peanuts followed peanuts the damage was severe. It appeared that the yield would be reduced by about 75 percent. In still another field where peanuts followed peanuts there were scattered spots where the plants were either dead or dying from root-knot. In this field most of the plants showed root-knot symptoms on the roots even when no symptoms were visible above the ground. In a third field infections of nematodes were found but the damage was slight. This field had been out of cultivation for five years and had been growing a voluntary crop of crotalaria each summer.

It appears, therefore, that the race or strain of the root-knot nematode that attacks peanuts is now present in Alabama and that it is on the increase.

ALABAMA AGRICULTURAL EXPERIMENT STATION, AUBURN, ALABAMA

REPORT OF ALFALFA-CLOVER DISEASE SURVEY IN VIRGINIA

S. B. Fenne, R. G. Henderson, T. J. Smith, C. L. Lefebvre,
H. M. Tysdal, O. F. Smith, C. O. Grandfield

During this survey, clover and alfalfa fields were visited at Blacksburg, Lynchburg, Charlotte C.H., Holland, Drewryville, Norfolk, Williamsburg, Norge and Richmond. An unusual amount of black stem (Ascochyta imperfecta) was found in practically every field visited except in the vicinity of Richmond. In several fields severe injury had already resulted. Alfalfa plants had been killed in considerable areas of these fields. However, in most instances, merely the tops were damaged and indications were that new shoots would appear. The unusually wet, cold period during March and early April was very favorable for black stem development. Black stem is not usually considered to be a very serious disease of alfalfa in Virginia.

Stem rot (Sclerotinia trifoliorum), which has been the most serious disease of alfalfa in Eastern Virginia, was present in many fields visited. The damage from stem rot, however, was less severe than during past years.

Several common leaf spot diseases were found in most alfalfa fields, but the damage from these diseases was of minor importance. Fusarium wilt (Fusarium oxysporum f. medicaginis) was found in several fields in the Richmond area. Aphid injury was general throughout the areas visited. In some cases, alfalfa had already been cut because of injury by these insects. Stem nematode (Ditylenchus sp.) was found for the first time in Virginia on the farm of Mr. W. J. Burlee in Henrico County near Richmond.

VIRGINIA POLYTECHNIC INSTITUTE AND U. S. BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

BOTRYTIS POLYBLASTIS FOUND IN CALIFORNIA

Lily H. Clark

In the spring of 1947 a watery decay was observed on some King Alfred daffodil blossoms held under humid conditions at the University of California, Los Angeles. The causal organism was found to be the fungus, Botrytis polyblastis Dowson, described (1) as causing narcissus "fire" in England. The disease is quite restricted geographically, occurring in England, Scotland, Ireland, and Jersey (5), and in the State of Washington in the United States (2,4). Gould (2) reported the disease as being rare and occurring mostly during warm moist seasons. This report from southern California extends the known occurrence of the disease. It was possible to observe only the flower symptoms at the time the disease was discovered, since the blossoms were obtained from a local florist and the grower could not be determined.

Before 1933, "fire" was thought to attack only the foliage, but in March of that year, Small (6) reported the overnight destruction of some mature flowers, and in 1934 McWhorter and Reynolds (4) noted prevalent flower infection in outdoor plantings of narcissus. Moore (5) also observed it on the blossoms, and stated that serious spotting may develop in transit on flowers which seem sound when packed. This apparently occurred in the present case since the florist reported having had difficulty in keeping some of the blooms. Seemingly healthy flowers rotted overnight when subjected to warm humid conditions.

Several very large hyaline spores were noticed on the original material, but they were collapsed and their place of origin could not be determined. Although the watery decay was reproduced by mycelial inoculations on healthy flowers, no more conidia were observed. Many microconidia were formed on the inoculated flowers as well as in culture, and in the latter, flat, black, smooth sclerotia, typical of those produced by Botrytis polyblastis were found.

Since the cultures did not sporulate they were grown on natural media sterilized according to the method described by Hansen and Snyder (3). Ground dried aster stems were mixed with plain agar in Petri dishes and these were then inoculated with bits of mycelium or sclerotia that had formed in the old cultures. The dishes were then placed on a window sill with north exposure. The cultures at first showed nothing but a mat of coarse white mycelium and an abundance of microconidia in certain parts of the dishes. However, after a week, glistening drop-like structures were observed near one of the old sclerotial transplants. These were found to be spores attached to very pale brown, upright conidiophores which arose from some of the bits of aster stem. Permanent mounts and drawings were made of some of these and the rest were used for inocu-

lations and germination studies. The next day a few conidiophores and conidia were seen arising from the sclerotium itself, but after this the culture ceased to sporulate, perhaps due to the hot dry weather at that time. The sparse sporulation, however, was enough to identify the fungus as Botrytis polyblastis. Apparently this is the first record of sporulation of this fungus on artificial media.

The conidiophores observed in culture were upright, variable in length (mostly 250-325 x 13-19μ), septate, and hyaline to pale brown. The distal end was quite fragile, collapsed readily, and bore rounded sterigmata. The spores were hyaline, pear-shaped, papillate at the lower end, large (35-43 x 28-39μ), with a uniformly thick wall. The fruiting structures in culture corresponded with those (1) from fresh plant material. The conidia from artificial media germinated just as rapidly as those produced in nature. At the end of half an hour several of the spores sown on water agar had seven radial germ tubes and after 1 1/2 hours some of these were over 80μ long. The spores obtained from culture were tested for pathogenicity by placing them on pieces of healthy green narcissus leaves held in moist Petri dishes. The symptoms produced were typical of those described for narcissus "fire". These symptoms were also obtained with bits of culture mycelium.

Various workers have reported the King Alfred variety to be only mildly affected, serious attacks being limited to a few cases. This appearance of the disease in California does not reveal whether it came in on shipped cut-flowers, or is established here. Due to climatic restrictions, however, it is not likely to become damaging in California.

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6. Small, T. Narcissus fire (Botrytis polyblastis, Dowson). Gard. Chron. 97: 304-305. 1935.

DIVISION OF PLANT PATHOLOGY, UNIVERSITY OF CALIFORNIA, LOS ANGELES

TWO UNUSUAL HOSTS

Samuel C. Damon and Walter H. Snell

From seed of *Metasequoia glyptostroboides* Hu and Cheng provided by Dr. E. D. Merrill, a small percentage of seedlings was produced. A few of these succumbed to damping-off, some as the result of attack of the young stem next to the cotyledons very shortly after emergence from the soil and others from attack at the ground line of seedlings two inches tall. A species of *Fusarium* was isolated, in pure culture in most cases, from the diseased areas.

In the last of May just as the leaves were beginning to develop, a branch of *Exochorda* (probably *racemosa* (Lindl.) Rehd,) 2 cm. thick was found to be dying. About eight inches of the basal portion of this branch and the contiguous basipetal part of the branch from which the first arose, the latter of which had been dead and partially decorticated for some time, was rather completely fluted with elongated rows and clumps of conidiophores. The fungus was identifiable as *Botrytis cinerea* Pers., both from microscopic examination and from cultures. The area of fruiting increased in length after the branch was brought into the laboratory.

Removal of the bark revealed a thick growth of mycelium between the outer and inner bark. Hyphae were readily detected at least 1 mm. deep in the wood. Cultures of wood chips in the affected areas yielded pure cultures of *Botrytis cinerea*. Inoculations have not yet been attempted.

BROWN UNIVERSITY, PROVIDENCE, RHODE ISLAND

ADDENDUM CONCERNING THE BINOMIAL MARSSONINA ROSAE

Kenneth F. Baker

Since the publication of a paper[1] on the nomenclature of the fungus causing black spot of rose, part of one of the earliest collections of this fungus has been found. The existence of a specimen of Fries' Erysiphe radiosum (Scleromyceti Sueciae No. 254. 1822) in the Farlow Herbarium[2] makes the specific epithet radiosum a name to be dealt with, because it antedates by five years the publication of Libert's rosae for the conidial stage. This specimen might, therefore, conceivably be interpreted as basis for a new combination.

Fries used E. radiosum in his Observationes of 1815 and 1824, and, in quotation marks, in the Elenchus of 1828 and the Systema mycologicum of 1829. He cited Libert's paper in the latter, but did not accept her binomial, Asteroma rosae. In the Summa vegetabilium Scandinaviae of 1849 Fries formally abandoned his earlier specific epithet and called the fungus Actinonema Rosae (Lib.) Fries. There is thus evidence in this series of papers that Fries at first accepted Acharius' epithet, radiosum, but that following the appearance of Libert's description he was uncertain about its status for some years and finally abandoned it entirely. The name was not accepted in the Systema mycologicum from which the nomenclature of the Fungi Imperfecti starts.

Since the book of exsiccati in which the specimen of Erysiphe radiosum appears is dated 1822, the specimen is of that year or perhaps earlier. These fungi were not treated in the Systema until 1829, and the specimen may, therefore, be considered as preceding the accepted starting date for this group and is, therefore, invalid (International Rules, Article 20).

The specific epithet, rosae, has been in continuous use since 1827 and is universally accepted. In conformity with Article 4 of the International Rules, and for the reasons enumerated above, it is considered that the name for the imperfect stage of the black-spot fungus should remain Marssonina rosae (Lib.) Lind as already proposed.[1] This is in line with the advice of Dr. G. R. Bisby.

DIVISION OF PLANT PATHOLOGY, UNIVERSITY OF CALIFORNIA, LOS ANGELES

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1 Baker, K. F. The history, distribution, and nomenclature of the rose black-spot fungus. Plant Dis. Reptr. 32: 260-274. 1948.

2 The specimen was examined through the courtesy of Dr. W. L. White, Farlow Herbarium.

PLANT DISEASES NEWLY REPORTED FROM VARIOUS LOCATIONS

ACTINOMYCES ON DAHLIA

By D. E. Ellis and H. R. Garriss

Specimens of dahlia roots which exhibited a profuse development of raised scab-like spots on the surface were received in January, 1948, from Rocky Mount, North Carolina. Macroscopic examination of the lesions immediately suggested those caused by the potato scab organism, Actinomyces scabies (Thax.) Güssow. The grower stated that the dahlias were grown in soil which received heavy applications of manure and other organic material. He noted the disease on only two of fifteen varieties grown. From additional specimens received in February and March, 1948, isolations were made using KenKnight and Muncie's medium for Actinomycetes (Phytopath: 29: 1000-1001. 1939). An Actinomycete was consistently isolated which exhibited cultural characteristics strongly suggestive of those of A. scabies. So far as we have been able to determine no Actinomycete has previously been reported on dahlia.

NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION AND EXTENSION SERVICE

CURVULARIA SPOT OF GLADIOLUS FROM MISSISSIPPI

By A. G. Plakidas

On August 25, 1948, a specimen consisting of several leaves of gladiolus bearing numerous large, brown to black spots was received from Carthage, Mississippi. The specimen was sent by R. T. Hobson, County Agent, who stated in the letter accompanying the specimen that a field of 150,000 plants, both from local and from Oregon grown corms, were affected in this manner.

The lesions fitted the description of the foliar symptoms for Curvularia spot as described by Magie[1], and Curvularia was found fruiting abundantly on the necrotic tissue.

I thought this brief note might be of interest to the distribution of this apparently new disease.

LOUISIANA AGRICULTURAL EXPERIMENT STATION

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1 Magie. R. C. Curvularia spot, a new disease of gladiolus. Plant Dis. Rept. 32 (1): 11-13. Jan. 15, 1948.

WILT OF POTATOES

By Karl H. Fernow

Wilts caused by Fusarium oxysporum and by Verticillium alboatrum are usually assumed to have less relationship to seed than to soil. A wilt observed in August and September in New York appears definitely related to the seed. Four plantings of Cobbler seed potatoes from the same grower in Prince Edward Island showed about 10 percent of this disease. Four plantings of Sebago showing high percentages all trace back to a single New York source. Tubers in affected hills show a superficial hydrosis extending from 1 mm. to 1 cm. into the flesh. These spots are visible from the outside, are often irregular in shape and from 2 or 3 mm. to 2 or 3 cm. in diameter. They usually occur near eyes and frequently at the seed end. It is believed that this symptom has not previously been reported in connection with any potato wilt disease.

DEPARTMENT OF PLANT PATHOLOGY, CORNELL UNIVERSITY, ITHACA, NEW YORK

THE OCCURRENCE OF STEM ANTHRACNOSE OF LIMA BEAN IN MARYLAND DURING THE 1948 SEASON

By W. F. Jeffers, L. O. Weaver, and C. E. Cox

Early in the growing season of 1948 a condition affecting lima beans was observed at Federalsburg, Maryland. Symptoms consisted of numerous reddish-brown, circular areas confined to the upper leaf surface. Lesions averaged about 3/16 inch in diameter and were slightly raised. The tissue was very tender but not disorganized. No fungus was found to be associated with these lesions although numerous bacteria were present.

Later in the season, similar symptoms were reported from Salisbury, Pocomoke and other areas on the Eastern Shore. Leaf infection at this time included a reddish discoloration along the veins of both surfaces and splotches on parenchyma tissue. Leaf infection was often so severe as to cause much defoliation and there was considerable loss from pod infection. Pod symptoms consisted of a uniform, non-sunken reddish discoloration without definite margins which in some cases involved the entire surface. This infection killed or stunted young pods and penetrated walls of mature pods. On pods collected during the first part of September, typical fruiting bodies of Colletotrichum truncatum (Schw.) Andrus & Moore were found. These consisted of black erumpent acervuli bearing several prominent setae. Spores and other characteristics were typical of the description of this organism.

PLANT PATHOLOGY DIVISION, UNIVERSITY OF MARYLAND, COLLEGE PARK

BRIEF NOTES ON PLANT DISEASES

SEVERE LOCAL OUTBREAK OF ASTER YELLOWS IN WEST VIRGINIA

By J. G. Leach

Aster yellows (virus) was very prevalent on lettuce in the Canaan Valley of West Virginia during the past summer. The Canaan Valley is an upland valley about 3000 feet above sea level where an effort is being made to stimulate the production of cool weather crops. This year an effort was made to try out commercial production of head lettuce. The soil and climate of this valley are, by virtue of the cool summer weather, ideally suited to the raising of this crop. On the strength of the promising yields obtained on a few trial plots last year, approximately 22 acres of head lettuce were planted this year. Aster yellows became very prevalent, as high as 50 percent of the plants in some fields being affected. The aster leaf hopper was very abundant in the lettuce fields. An interesting observation was the absence of symptoms of aster yellows on the weeds growing in the vicinity of the lettuce fields. The source of the viruliferous leaf hoppers therefore is not known. Aster yellows promises to be a limiting factor in the production of head lettuce in this region and probably will discourage the growth of this industry.
WEST VIRGINIA AGRICULTURAL EXPERIMENT STATION, MORGANTOWN

NOTES ON CABBAGE BLACK ROT IN NORTH CAROLINA

By H. R. Garriss and D. E. Ellis

Black rot of cabbage (Xanthomonas campestris (Pam.) Dowson) was unusually prevalent in eastern North Carolina during the fall of 1947 and the spring of 1948 and is quite widespread on the western North Carolina summer crop.

In November 1947 ten fields in the Weeksville area of Pasquotank County were visited. In five fields infection was severe and uniformly distributed throughout the planting. In two fields it was of moderate severity but uniformly distributed. Two fields showed only a trace of black rot and one was apparently free from disease. Observations and notes on cropping history strongly pointed to the seed as the major source of infection. However, in one instance there was evidence that the organism was carried over from a spring planting of cabbage in 1947. The grower planted two fields from the same lot of seed. In one field severe black rot developed, while in the other no black rot was found. Cabbage was grown on the former field in the spring of 1947, while the latter had not been planted to cabbage for at least two years.

In March and April 1948 several cabbage fields were visited in the Wrightsboro area of New Havover County. Black rot was moderate to severe and uniformly distributed in most fields visited. One 2-acre field, which had not been planted to cabbage for at least two years, was practically a total loss due primarily to black rot.

Black rot is apparently causing considerable damage to the 1948 crop in the Hendersonville area of western North Carolina. According to Mr. R. P. Scheffer, graduate assistant stationed in the area, black rot was observed in several fields in late June. Infection ranged up to 20 percent. In one early planting visited on July 16, black rot infection was estimated at about 85 percent of the plants, whereas in an adjacent late planting only a trace of black rot was found.
NORTH CARCLINA AGRICUITURAL EXPERIMENT STATION AND EXTENSION SERVICE

CHECK LIST REVISION

Freeman Weiss

ONAGRACEAE

BOISDUVALIA

BOISDUVALIA DENSIFLORA (Lindl.) Wats.,SPIKE-PRIMROSE (1); other spp. (2). Annual herbs of the Pacific States; (1) is sometimes grown in gardens.

Puccinia glabella Holw. (II,III), rust. Nev., Ore., Utah (2). O and I unknown.
P. oenotherae Vize (0,I,II,III). Calif., Ida., Nev., Ore., Wash. (1,2)
P. vagans (DC.) Arth. var. epilobii-tetragoni (DC.) Arth. (0,I,II, III). Calif., Nev. (1); Ida., Nev., Ore., Utah (2)

CLARKIA (ONAGRACEAE)

CLARKIA ELEGANS Dougl. (1); other spp. (2). Annual herbs, mostly of Calif. and other Pacific States; (1) is widely cult. in gardens.

Alternaria tenuis Nees ex Cda., secondary leaf spot. Calif. (1).
Botrytis cinerea Pers. ex Fr., gray-mold leaf spot, stem canker. Calif., N. Y. (1).
Colletotrichum sp., anthracnose. Pa. (1).
Fusarium sp., stem rot, wilt. Calif. (1).
Peronospora arthuri Farl., downy mildew. Calif. (1).
Phytophthora cactorum (Leb. & Cohn) Schroet., stem rot. N. Y. (1).
Puccinia oenotherae Vize (0,I,II,III), rust. Calif., Wash. (1,2); Ida., Nev., Ore. (2).
Pucciniastrum pustulatum (Pers.) Diet. (II,III), rust. N. Y., Alaska (1).
Pythium debaryanum Hesse, damping off. Calif. (1).
Rhizoctonia solani Kuehn, root rot, damping off. Conn. (1).
Synchytrium fulgens Schroet., leaf gall. Calif. (1).
Verticillium albo-atrum Reinke & Berth., wilt. Calif. (1).

Yellows -- virus (Chlorogenus callistephus var. californicus Holmes, Callistephus virus 1A K.M.Sm.). Calif. (1).

EPILOBIUM (ONAGRACEAE)

EPILOBIUM ANGUSTIFOLIUM L., WILLOWWEED, FIREWEED (1). Perennial herb of meadows and burned-over woodlands, widely distributed in the North Temperate Zone; an important honey plant and sometimes grown in wild gardens, also of forage value. E. LATIFOLIUM L. (2) and other spp. (3), occurring in the far North and West, are of similar but less utility.

Botrytis cinerea Pers. ex Fr., gray-mold blight. Alaska (1,3)
Cercospora montana (Speg.) Sacc., leaf spot. Calif., Tex., Utah, Wash., Wis., Wyo. (1); N. H., N. Mex., N. Dak., Ore., Wis. (3) C. epilobii W.G.Schneid., though earlier, was published without description; the two probably synonymous.
Diaporthe racemula (Cke. & Pk.) Sacc., on stems. N. Y. (1).
Didymosphaeria fenestrans (Duby) Wint., on stems. Ida., Alaska (1).
Discosia bubakii Kab. (Hyaloceras kriegerianum (Bres.) Died.), leaf spot. N. Y., Wis. (1).
Doassansia epilobii Farl., leaf smut. Colo., N. H. (3).
Dothidella adusta (Fckl.) Lind, on leaves. Alaska (1).
Erysiphe polygoni DC., powdery mildew. Wash. (3)
Euryachora epilobii (Fr.) Hoehn., on stems. N. Y. (1).
Heterodera marioni (Cornu) Goodey, root knot. (3)
Leptosphaeria cylindrospora Niessl & Auers., dead stems. Colo., Ida., Wash. (1).
Microsphaera sp., powdery mildew. Ill. (3)
Nectria cinnabarina Tode ex Fr., on stems. Alaska (1).
Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves. Me. (1).
Phyllosticta chamaenerii Allesch., leaf spot. Ore. (1).
P. wyomingensis Solheim. Wyo. (1).
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1).
Plasmopara epilobii (Rabh.) Schroet., downy mildew. Alaska (2); Ill., N. Y. (3).
Puccinia extensicola Plowr. var. oenotherae (Mont.) Arth. (0,I), rust. Colo. (1). II and III on Carex spp.
P. gigantea Karst. (III). Ida., Mont., Tex., Wash., Wyo., Alaska (1).
P. oenotherae Vize (0,I,II,III). Calif. (3)
P. vagans (DC.) Arth. var. epilobii-tetragoni DC. (0,I,II,III). N. Dak. to N. Mex., Calif., and Alaska (3)
P. scandica Johans. (III). Utah, Wash., Wyo. (3).
P. veratri (DC.) Duby (0,I). N. H., also Mont. to Utah, Wash., and Alaska (3). II and III on Veratrum sp.
P. epilobii DC. (III). Mich., Wyo. (3).
Pucciniastrum pustulatum (Pers.) Diet. (II,III), rust. Northeastern States to Pacific Northwest, also Colo., N. Mex., and Calif. (1,3); Alaska (2). 0 and I on Abies spp.

EPILOBIUM cont.

Ramularia cercosporoides Ell. & Ev., leaf spot. Mont., Tex., Wash., Wyo. (1); Alaska, Wyo., (3)
R. karstenii Sacc. Colo. (1)
R. punctiformis (Schlecht.) Hoehn. Wis. Said to be conidial stage of Mycosphaerella epilobii Jaap.
Sclerotium rolfsii Sacc., southern blight. Tex. (1).
Septoria epilobii West., leaf spot. Calif., Del., Ill., Vt., Wis., Alaska (3).
Sphaerotheca humuli (DC.) Burr., powdery mildew. Calif., Iowa, Kans., Mich., N. J., Ore., S. Dak., Wash., Wis., Wyo., Alaska (3)

FUCHSIA (ONAGRACEAE)

FUCHSIA spp. Shrubs, mostly of Mexico and western S. America, commonly grown as house plants and summer bedding plants, or in the open in Calif. The horticultural forms, collectively F. hybrida Hort., are derived chiefly from F. magellanica Lam. and F. fulgens Moc. & Sessé.

Botrytis cinerea Pers. ex Fr., gray-mold blight. W. Va., Alaska.
Didymella fuchsiae Cke. & Harkn., on stems. Calif.
Diplodia fuchsiae Cke. & Harkn., on stems. Calif.
Heterodera marioni (Cornu) Goodey, root knot. Calif., Md., Ore.
Phomopsis sp., ?dieback. Va.
Pythium rostratum Butl. and P. ultimum Trow, rootlet rot. ?Calif.
Septoria sp., leaf spot. Okla.
Uredo fuchsiae Arth. & Holw. (II), rust. Ohio.

Spotted wilt -- virus (Lethum australiense Holmes, Lycopersicon virus 3 K.M.Sm.). Calif.

GAURA (ONAGRACEAE)

GAURA spp., as G. BIENNIS L. (1), G. COCCINEA Nutt. ex Pursh (2), G. SINUATA Nutt. (3), others (4). Mostly perennial herbs of plains and waste ground in the Central and Western States, (2) also in the East; sometimes grown in wild gardens and some are useful to wildlife.

Cercospora gaurae Kell. & Swing., leaf spot. N. Y. (1); Okla., Tex. (1,3).
Erysiphe polygoni DC., powdery mildew. Colo., Tex. (4).
Mycosphaerella sp. (Sphaerella granulata Ell. & Ev.), on stems. Kans. (1).
Peronospora arthuri Farl., downy mildew. Kans., Nebr. (4)

GAURA cont.

Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves. Va. (1).
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1,2,4).
Puccinia extensicola Plowr. var. oenotherae (Mont.) Arth. (0,I), rust. Nebr. (2); Tex. (3); Colo., Nebr., Tex. (4). II and III on Carex spp.
Septoria gaurina Ell. & Kell., leaf spot. Ill., Kans., Okla. (1); N. Dak., Okla. (2); Kans., Nebr., N. Mex., Tex. (4).
S. oenotherae West. Tex. (4).
Synchytrium fulgens Schroet., leaf gall. Tex. (4)
Uromyces plumbarius Pk. (0,I,II,III), rust. N. Y. to Va., Tex., and Wis. (1); N. Dak. and Mont. to Miss. and N. Mex. (2); Okla., Tex. (3); also on other spp. in the general range.

Yellows -- virus (Chlorogenus callistephus var. californicus Holmes, Callistephus virus 1A K.M.Sm.). Calif. (4)

GAYOPHYTUM (ONAGRACEAE)

GAYOPHYTUM spp., GROUND-SMOKE. Annual herbs of the Western States, some of ornamental value or useful to wildlife.

Cercospora gayophyti Ell. & Ev., leaf spot. Calif.
Puccinia vagans (DC.) Arth. (0,I,II,III), rust. On various spp. from N. Dak. to N. Mex., Calif., and Wash.; 2 vars., epilobii-tetragoni DC. and gayophyti (Billings) Arth., are distinguished technically.
Ustilago gayophyti Harkn., seed smut. Calif., Nev., Ore., Utah.

GODETIA (ONAGRACEAE)

GODETIA spp. Annual herbs of the Pacific States, chiefly Calif.; grown for ornament, especially G. AMOENA Lilja (1), and G. GRANDIFLORA Lindl. (2); others (3).

Botrytis cinerea Pers. ex Fr., gray-mold blight. Alaska (1).
Heterodera marioni (Cornu) Goodey, root knot.
Peronospora arthuri Farl., downy mildew. Calif. (1)
Puccinia oenotherae Vize (0,I,II,III), rust. Calif., Ore., (1); Calif.(2); Calif., Nev., Wash. (3)
P. vagans (DC.) Arth. (0,I,II,III). Calif. (3)
Pucciniastrum pustulatum (Pers.) Diet. (II,III), rust. Alaska (2). O and I on Abies.
Pythium ultimum Trow, root rot. Mo. (2).
P. vexans DBy. ?Calif. (2)
Rhizoctonia solani Kuehn, damping off. Ill.

GODETIA cont.

Yellows -- virus (Chlorogenus callistephi var. californicus Holmes, Callistephus virus 1A K.M.Sm.). Calif. (2)

JUSSIAEA (ONAGRACEAE)

JUSSIAEA spp., WATER-PRIMROSE, as J. CALIFORNICA (S. Wats.) Jepson (1), J. DECURRENS (Walt.) DC. (2), others (3). Mostly perennial herbs of marshy habitats in the Southern States (2), Calif. (1), or tropical America; grown for ornement in aquatic gardens and useful to wildlife.

Aecidium betheli Arth. (I), rust. Calif. (1).
Alternaria sp., leaf spot. Okla. (2).
Cercospora jussiaeae Atk., leaf spot. Ala., Okla., Tex. (2,3).
Colletotrichum jussiaeae Earle, leaf spot. Ala., Tex. (2).
Puccinia jussiaeae Speg. (0,I,III), rust. Miss. (2).
Septoria jussiaeae Ell. & Ev., leaf spot. Ala., Fla., La., Tex. (3).
Uredo guaynabensis Kern & Whet. (II), rust. Fla., P. R. (3)

LUDWIGIA (ONAGRACEAE)

LUDWIGIA spp., as L. ALTERNIFOLIA L., SEEDBOX (1); L. PALUSTRIS (L.) Ell. (2); others (3). Annual or perennial bog herbs, mostly in the Southeastern and Southern States; sometimes grown in aquatic gardens and useful to wildlife.

Cercospora ludwigiae Atk., leaf spot. Ala. (1).
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot. Va. (1).
Phyllosticta ludwigiae Pk., leaf spot. N. Y. (2); Wis. (3).
Physalospora obtusa (Schw.) Cke., on stems. Ga., S. Car. (1).
Puccinia jussiaeae Speg. (0,I,III), rust. Fla., Md., (1); Fla., La., Ohio, Tex. (2); Del. to Fla., Miss., and Wis., also Calif. (3)
Septoria ludwigiae Cke., leaf spot. Ill., Md., Miss., Pa. (1); Calif., Del., Ill., N. Y., Ore., S. Car., Wis. (2); Fla., N. Y. (3).

OENOTHERA (ONAGRACEAE)

OENOTHERA spp., EVENING-PRIMROSE. Numerous annual or perennial herbs, widely distributed on plains and old fields throughout the U. S.; many of ornamental value and widely cult., a few are weeds in cultivated ground, several are useful to wildlife. Represent-

OENOTHERA cont.

ative spp. listed here are O. ALBICAULIS Pursh (with O. nuttallii (Sweet) Spach and O. pallida Lindl.) (1); O. BIENNIS L. (2); O. FRUTICOSA L. (with O. perennis L.), SUNDROPS (3); O. LACINIATA L. (4); O. OVATA Nutt., GOLDEN-EGGS (5); O. SPECIOSA Nutt. (6); others (7).

Aecidium anograe Arth. (0,I), rust. Nebr. (1).
Alternaria tenuis Nees ex Cda., leaf spot (? secondary). N. J. (7).
Botrytis cinerea Pers. ex Fr., gray-mold blight. Alaska (7).
Cercospora oenotherae Ell. & Ev., leaf spot. Kans. (1); Ala., W.Va. (2); Tex. (6).
C. oenotherae-sinuatae Atk. Ala. (4); N. Car. (7)
C. didymospora Ell. & Barth., on leaves and seed pods. Ore. (1); Kans. (2,7).
Cuscuta arvensis Beyrich, dodder. Okla. (7)
Disporthe arctii (Lasch) Nits., on stems. Ga. (2).
Erysiphe polygoni DC., powdery mildew. General (2); occasional on (1), (3), (4), and (7) throughout their range.
Leptosphaeria ellisiana Berl., on dead stems. N. J., N. Dak. (7).
Macrophoma oenotherae-biennis Dearn., on stems and seedpods. N. Y. (2).
Mycosphaerella sp. (Sphaerella oenotherae Ell. & Ev.), on stems and seedpods. N. J. (2)
Peronospora arthuri Farl., downy mildew. Mass. to Miss., Nebr., and S. Dak. (2); Kans., Okla. (4); Mont., N. Dak. (7).
Pestalotia oenotherae Ell. & Barth., leaf spot. Ohio (2); Okla. (7).
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot. Md., Ga., N. Car., Va. (2); S. Dak. (7).
Phomopsis oenotherae (Dearn.) Petr., on seedpods. N. Y. (2)
Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (4,7).
Physalospora obtusa (Schw.) Cke., on stems. W. Va. (2); Ga. (4). Also P. rhodina (Berk. & Curt.) Cke. in N. J. (2).
Puccinia aristidae Tracy (0,I), rust. Ariz., Nev. (7). II and III on Aristida and Distichlis.
P. extensicola Plowr. var. oenotherae (Mont.) Arth. (0, I). Me. to Ala., Colo., and N. Dak. (2); also on (3) and (4) within this range, and on (7) to Tex. and Calif. II and III on Carex spp.
P. oenotherae Vize (0,I,II,III). Mont. to Calif. and Wash. (7).
P. oenotherae var. heterantha (Ell. & Ev.) Arth. Calif. (5); Mont. to Colo., Calif. and Ida. (7)
Rhizoctonia solani Kuehn, root rot. Tex. (4).
Septoria oenotherae West., leaf spot. N. Dak. (1); Me. to Fla., Okla. and S. Dak. (2); also on (3) and (4) within this range; Calif. (5); and to N. Mex. and Utah (7).
Synchytrium fulgens Schroet., leaf gall. Kans., N. Y. (2); Miss. (3); Ala., La., Miss., N. Car., Okla., Tex. (4); also to Calif. and Iowa (7)

OENOTHERA cont.

Uromyces plumbarius (0,I,II,III), rust. General (2,4); Calif. (5); also on other spp., mostly in the Western States, occesional in the East.

Mosaic -- unidentified virus. Pa. (7)

ZAUSCHNERIA (ONAGRACEAE)

ZAUSCHNERIA CALIFORNICA Presl, CALIFORNIA-FUCHSIA, FIRE-CHALICE (1); Z. GARRETTII A. Nels. (2). Perennial herbs of Calif. to Ariz. and Utah; grown for ornament.

Puccinia oenotherae Vize (0,I,II,III), rust. Calif. (1), Utah (2)

ORCHIDACEAE*

I. Exotic orchids, cultivated under glass commercially for cut flowers, as CATTLEYA (1), CYMBIDIUM (2), DENDROBIUM (3), EPIDENDRUM (4), LAELIA (5), ODONTOGLOSSUM (6), and ONCIDIUM (7), PHALAENOPSIS (8); also miscellaneous spp. (9), in fanciers' collections and endemic in tropical America.

Botrytis cinerea Pers. ex Fr., gray mold, flower spot. Occesional in greenhouse culture.

Cercospora spp., leaf spot. C. angreci Feull. ex Roum., and C. odontoglossi Prill. & Del., on imported plants (5,6,7).

Chaetodiplodia sp., leaf spot. On imported plants (1).

Colletotrichum spp., anthracnose (leaf & stem spot, stem rot) or secondary on moribund parts. General on cultivated orchids, also on collected plants especially in commercial handling. Commonly reported spp. are C. orchidearum Allesch. (? saprophytic) and C. cinctum (Berk. & Curt.) Ston., sometimes also C. gloeosporioides Penz. The latter two, also reported as Glomerella cincta (Ston.) Spauld. & Schrenk and G. cingulata (Ston.) Spauld. & Schrenk, respectively, are probably at least capable of wound parasitism. Intergrades with Gloeosporium commonly occur, and numerous specific names have been applied to what are probably only veriant forms of these spp. on different hosts;

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* Because of the numerous genera in this family and the relatively few fungi and other organisms reported as parasitic on them in the U. S., the hosts are divided into two main groups, as shown, each containing a number of genera. The genus Vanilla, of special economic interest, is listed separately.

ORCHIDACEAE: I (exotic spp.), cont.

their identities and pathological effects not sufficiently known to warrant present discrimination. See also Gloeosporium, Glomerella, Physalospora, and Volutella.

Diplodia spp., on old leaves & stems. D. paraphysaria Sacc. reported in Md., Mo., and On imported plants (1); D. natalensis Pole-Evans on imported plants (1).

Erwinia carotovora (L.R.Jones) Holland, soft rot. N. J. (1).

Gloeosporium spp., anthracnose, secondary leaf spot. G. affine Sacc., on imported plants (1,3,4,5,8,9). G. cattleyae P. Henn. reported in Va., P. R., and on imported plants (1); also other names as G. dendrobii Maubl. (3), G. epidendri P. Henn. (4), and G. laeliae P. Henn. (5) on imported plants, but identity doubtful. For G. cinctum Berk. & Curt. see Colletotrichum.

Glomerella cincta (Ston.) Spauld. & Schrenk, and G. cingulata (Ston.) Spauld. & Schrenk. Ascigerous stages respectively of Colletotrichum cinctum and C. gloeosporioides, and doubtfully distinguishable; sometimes mentioned in reports but usually in reference to the conidial stage.

Hendersonia epidendri Keissl. on leaves. Virgin Is. (4)

Macrophoma cattleyicola P. Henn., leaf spot. Hawaii (1).

M. oncidii P. Henn., leaf spot or present on old stems and leaves. Canal Zone (7); also on imported plants (1,3,5,7,8).

Meliola sp., black mildew. P. R. (9).

Morenoella calami Rac., black mildew. P. R. (4).

Nectria bulbicola P. Henn. (? N. ochroleuca (Schw.) Berk.), dry rot or ? saprophytic on imported plants (8).

Phyllosticta spp., leaf spot. N. J. (9); Pa. (5,9). P. laeliae Keissl. (5), P. nigromaculans Sacc. (7), on imported plants.

Physalospora spp., spotting or decay of leaves and stems of imported plants. P. camptospora Sacc. (9); P. cattleyae Maubl. & Lasnier (1); P. orchidearum P. Henn. (1,3,4,7,8).

Pratylenchus pratensis (DeMan) Filip., root nematode. Md. (1)

Pythium splendens Braun, leaf rot. ?N.Y. (1)

Rhizoctonia solani Kuehn, root rot. Okla. (4). Various Rhizoctonia spp. in so-called mycorrhizal associations have been isolated from roots of native orchids and doubtless occur in cultivated ones but no specific reports of the latter are at hand.

Sclerotium rolfsii Sacc., stem rot. On imported plants (1).

Selenophoma sp., leaf spot. N. J., N. Y. (3); imported plants (2, 3,5,6,7).

Uredo behnickiana P. Henn. (II), rust. N. J. (1,4); N. Y. (1); Canal Zone (7); imported plants (1,4,7).

U. epidendri P. Henn. (II). On imported plants (4).

U. guacae Mayor (II). Fla., P. R. (4).

U. nigropuncta P. Henn. (II). Fla. (4,9); P. R. (9); also on imported plants (1,6).

?U. oncidii P. Henn. (II). Hawaii, also imported plants (7).

ORCHIDACEAE: I (exotic spp.), cont.
Volutella albido-pila Boud., leaf spot. On imported plants (8).

Mosaic -- suspected virus but not confirmed. Calif., Ill., N. J., N. Y., Ohio (2).

II. Native orchids. Perennial herbs of woodlands, bogs, and meadows, sometimes grown in wild gardens, as APLECTRUM (1), CALOPOGON (2), CYPRIPEDIUM (3), GOODYERA (4), HABENARIA (5), POGONIA (6), SPIRANTHES (7), others (8)

Aecidium graebnerianum P. Henn. (I), rust. Calif., Mont., Ore., Wash., Alaska (5).
Cercospora cypripedii Ell. & Dearn., leaf spot. N. Y., Wis. (3).
Fusicladium aplectri Ell. & Ev., leaf spot. Del. (1).
Leptosphaeria corallorhizae Pk., on stems. N. Y. (8).
Mycosphaerella cypripedii (Pk.) Lindau, leaf spot. N. Y. (3).
Phoma corallorhiza Ell. & Ev., on stems. N. Y. (8).
Phyllosticta aplectri Ell. & Ev., leaf spot. Del. (1).
Puccinia cypripedii Arth. & Holw. (II, III), rust. Ind., N. J. (2); Iowa, Mich., Va., Wis. (3). 0 and I unknown.
Pucciniastrum goodyerae (Tranz.) Arth. (II,III), rust. Calif., Colo., N. Mex., Ore., Wash. (4).
Rhizoctonia spp., in roots, mycorrhiza. The following special forms have been reported on various hosts as listed: R. borealis J.T.Curtis (4,7); R. gracilis Burgeff (5); R. lanuginosa G.Bernard (2,4); R. monilioides J.T.Curtis (5,6,7,8); R. neottiae Wolff (1); R. repens G.Bernard (2,4,5,6,7,8); R. robusta Burgeff (3,5); R. sclerotica Burgeff (3,5,7); R. stahlii Burgeff (5,7); R. subtilis Burgeff (3,5); R. s. var. nigra J.T. Curtis (7); all in Wis. except R. repens also in N. H. (7), but probably widespread. The symbiotic relationships and host specificity formerly claimed have not been substantiated, and these fungi may be regarded as saprophytic or weakly parasitic, having no special function in seed germination and not restricted to particular hosts.
Septoria calypsonis Povah, leaf spot. Mich. (2).
Uredo gynandrearum Cda. (II), rust. P. R. (5)

VANILLA FRAGRANS (Salisb.) Ames, VANILLA. Perennial vine of tropical America, cult. for ornament and for the seedpods from which a flavoring extract is obtained.

Botryosphaeria vanillae (Ston.) Petch & Ragunathan, leaf & pod spot. Fla., tropical America.
Cephaleuros virescens O.Kunze, green scurf. P. R.

VANILLA cont.

Fusarium oxysporum Schlecht. f. vanillae Tucker, root rot, wilt. P. R.

F. solani (Mart.) App. & Wr., root rot (? secondary). P. R.

Gloeosporium vanillae Cke. See Volutella vanillae.

Glomerella cingulata (Ston.) Spauld. & Schrenk, leaf and pod spot. Hawaii, P. R.

Lembosia rolfsii Horne, black mildew. Fla.

Pellicularia koleroga Cke., thread blight. P. R.

Sclerotium rolfsii Sacc., stem rot. P. R.

Volutella vanillae (Del.) Petch & Ragunathan, leaf and pod spot. Based on Vermicularia vanillae Del. but the earlier Gloeosporium vanillae Cke. may be the same; said to be the conidial stage of Botryosphaeria vanillae. Fla.

OSMUNDACEAE

OSMUNDA spp., as O. CINNAMOMEA L., CINNAMON FERN (1); O. CLAYTONIANA L., INTERRUPTED FERN (2); O. REGALIS L., ROYAL FERN (3). Tall ferns of damp woods and bogs of the Eastern and Central States and southward, (1) and (3) also in tropical America; used in wild gardens.

Dothidella osmundae (Peck & G.W.Clint.) Sacc., on dead leafstalks. N. Y. (3). Also referred to Phyllachora, perhaps misplaced in both genera.

Gloeosporium osmundae Ell. & Ev., leaf spot. Mich. (1).

Leptostroma filicinum Fr. (= Rhopographus filicinus (Fr.) Fckl.), on dead leafstalks. Me., Pa. (1); probably general.

Leptostromella filicina (Berk. & Curt.) Sacc., on dead leafstalks. Miss., Ohio, Pa., Tenn., Va. (1); N. Y. (3); probably general.

Leptothyrium litigiosum (Desm.) Sacc. (= Microthyrium litigiosum Sacc.), on dead leafstalks. Ga., S. Car. (1).

Mykosyrinx osmundae Pk., inflorescence smut. N. Y. (1,3); Mich., Wis. (3).

Typhula filicina Pk., on dead leafstalks. N. Y., Va. (1)

Uredinopsis osmundae Magn. (II,III), rust. Northeastern and Great Lakes States (1,2,3); also to Fla. and Ala. (1,3). O and I on Abies balsamea.

OXALIDACEAE

OXALIS spp., WOOD-SORREL. Numerous, tufted or creeping perennial herbs, sometimes bulbous or with tuberous roots, native and introduced; some of the latter are grown for ornament, others are troublesome garden and lawn weeds; several are useful to wildlife. The following records pertain mostly to the intro-

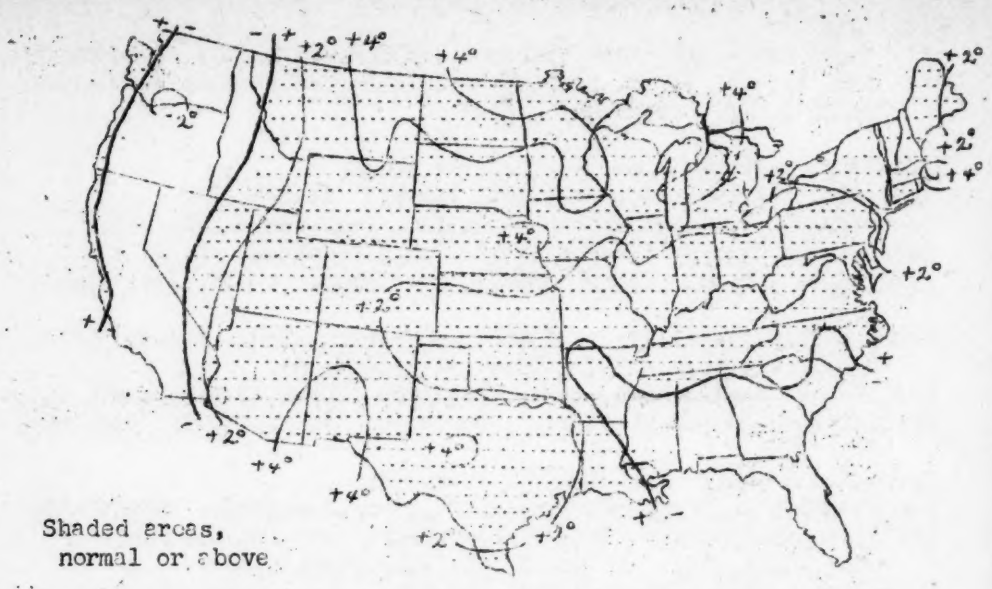
OXALIS cont.

duced but widely naturalized O. ACETOSELLA L. (1), O. CORNICULATA L. (2), and O. STRICTA L. (3); and to the native O. VIOLACEA L. (4); other spp. (5).

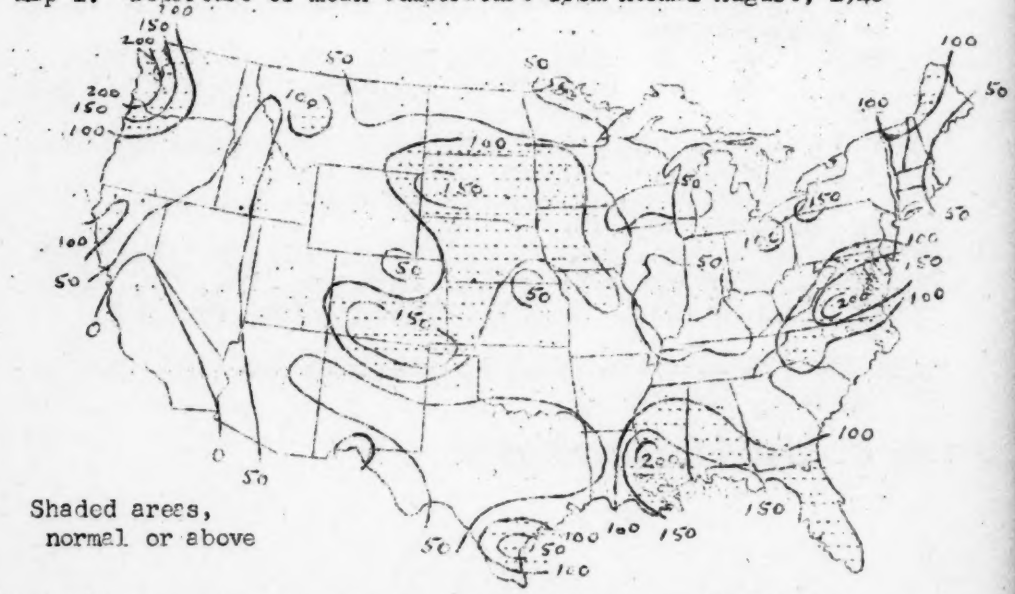
(Aecidium oxalidis Thuem.): Puccinia sorghi
Botrytis cinerea Pers., gray mold blight. Alaska (5).
Cercospora oxalidiphila Chupp & Muller, leaf spot. Wis. (3)
Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N. Y. (3)
Heterodera marioni (Cornu) Goodey, root knot. ? Fla. (2); Hawaii (5).
Microspheera russellii C.W.Clint., powdery mildew. Me. to W. Va., Kans., and Minn. (2,3); Wash. (3); Ohio (5).
Phyllachora oxalina Ell. & Ev., tar spot. Del. (2); Me., Vt. (3).
Phyllosticta guttulatae Halst., leaf spot. Vt. to N. J., Ind., and Wis. (2,3)
P. oxalidis Sacc. Tex. (2,3,5); Wis. (3)
Pratylenchus pratensis (DeMan) Filip., root nematode. Hawaii (5)
Puccinia andropogonis Schw. var. oxalidis Arth. (0,I), rust. Okla., Tex. (2). II and III on Andropogon spp.
P. oxalidis (Lév.) Diet. & Ell. (II,III). La., Miss., N. Mex., Tex. (4); Fla., Ga., S. Car., Tenn., Tex., P. R. (5); 0 and I on Mahonia repens.
P. sorghi Schw. (0,I). Ind., Iowa, Kans., Mich., N. & S. Dak., Tex. (2,3); Kans., Miss., Nebr. (4); Okla., Tex. (5). II and III on Zea mays and Euchlaena mexicana.
Ramularia oxalidis Farl., leaf spot. N. H., Pa., Tenn. (1); Vt. (1,2); Nebr., N. H., N. Mex. (4); Ore. (5).
Septoria acetosella Dearn. & House, leaf spot. N. Y. (1).
S. oxalidis Lind. Ore. (5)
Thielaviopsis basicola (Berk. & Br.) Ferr., root rot. Conn. (3).
Ustilago oxalidis Ell. & Tracy, seed smut. Mo., Pa., Tex., W. Va. (2); Conn. to Miss., Tex., and Wis. (3); Ohio, Tex. (5).

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Tex. (2,3,4)

DIVISION OF MYCOLOGY AND DISEASE SURVEY



Map I. Departure of mean temperature from normal August, 1948



Map II. Percentage of normal precipitation, August, 1948

AUGUST WEATHER

From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for week ending September 7, 1948.

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